DEPARTMENT OF VETERANS AFFAIRS
NATIONAL CEMETERY ADMINISTRATION
2006 ENVIRONMENTAL EXCELLENCE AWARDS NOMINATION

AWARD CATEGORY: Waste/Pollution Prevention

NOMINATION TITLE: Wash Station Redesign at
Riverside National Cemetery

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LOCATION:

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Project Summary

Vehicles/equipment at Riverside National Cemetery require washing prior to maintenance and to maintain an acceptable appearance. The wash water may contain grease, oil, and grass clippings, and drained into a grassed swale or storm water drain. These wash activities used approximately 400,000 gallons of potable water per year.

The redesigned wash rack, with the WaterStax Wash Water Treatment System, now collects the wash water for reuse. It eliminated the discharge of wash water into the environment. The system resulted in: 1) a 100% reduction in potentially grease and oil-containing wash water run off, and 2) a 99% reduction in potable water use, saving an estimated $ 11,400 per year.

The wash water treatment system is very innovative. The first section has a filter that removes grass clippings and sediment. The second section has a filter that separates the oil/grease for treatment with biological enzymes that breaks the oil/grease down into water and carbon, resulting in no releases of oil/grease into the environment. The treated water is then clean enough to be reused for wash water. A high pressure nozzle was added as well to further reduce water use and improve the efficiency of water use during vehicle/equipment washing.

Background

The RNC new wash station is equipped with water recycling equipment that captures used wash water for treatment and reuse. Any wash water discharged to the sanitary system is pretreated before disposal. The new wash station includes a roughing filter to remove grass clippings and a bioremediation tank that uses an oil/water separator and oil/grease eating bacteria to remove petroleum hydrocarbons from the waste stream.

The new wash station design at Riverside National Cemeteries achieves the goals included in Executive Orders 13101 and 13123 regarding pollution prevention and resource conservation. The WaterStax treatment system incorporated into the redesign uses biological agents to pre-treat the recycled water reducing the amount of hydrocarbons entering the waste stream. By breaking these chemicals down into biodegradable components, the new water recycling unit eliminates potential sources of water pollution. The redesign also eliminated uncontrolled surface discharge of potentially contaminated wash water. The wash water disposed of at these national cemeteries complies with local, state, and federal laws requiring pretreatment prior to discharge to the sanitary sewer.

Water conservation is another important environmental goal for all VA facilities, but is especially important for the Southern California national cemeteries. The new system recycles used wash water continuously, with small amounts removed weekly to maintain clarity of the water. This improves wash water use efficiency by reusing water until its clarity is reduced to a preset level, then a small portion of it is disposed of in the sanitary sewer. The new system also features a high pressure nozzle that removes debris more effectively while using less water.

Nominees

Mr. Reiker identified and initiated the original replacement of the wash racks at both cemeteries when he was the MSN Engineer. Mr. Schem, the current MSN Engineer, and Ms. Richards, Project Civil Engineer, supervised the design and construction of the improved vehicle and equipment wash stations at Riverside and subsequently at Los Angeles National Cemetery. Mr. Rodriquez, Cemetery General Foreman, worked with Mr. Reiker to identify the problem and solution, and then worked with all parties to facilitate the design, construction, and operation of the new wash rack.

Mr. Reikers', Mr. Schems', Ms. Richards', and Mr. Rodriguez's work contributed to NCA's goal of complying with all applicable Federal, State, and local environmental requirements, continuing to improve in environmental performance at all NCA facilities, and a significant reduction of releases of oil and grease into the environment.[1]

1. Does the project involve the use of innovative approaches, techniques, and technologies?

The project uses the innovative technique of using special screens to remove grass and debris, then special filters to remove oil and grease, then specially developed microbes to break down the hydrocarbons in the grease and oil into water and carbon, which are not hazardous. The water is then recycled and reused until it becomes too cloudy for use, then only a small portion is drained to restore the water clarity. This eliminated the offsite flow of wash rack water, and substantially reduced water usage.

Normally, wash rack water passes through an oil water separator that does not remove all oil and grease and then goes to a storm or sanitary sewer. The redesigned wash station at Riverside National Cemetery was NCA's pilot water recycling system to identify alternatives to a simple oil/water separator, and have had an important impact on water conservation at other new and active cemeteries. Past wash rack water recycling projects within the network of national cemeteries have had mixed results. Although cemetery directors and maintenance supervisors appreciate the benefits of recycling water, prior equipment was difficult and costly to maintain and operate.

The WaterStax system includes specially developed technology for removing hydrocarbon contaminants from the wash water and is also specifically designed for removing grass clippings associated with large scale turf grass and landscape maintenance operations.

2. Is the project cost effective when considering life cycle costs?

The Life Cycle Cost Analysis confirmed that the redesign of the wash rack was very cost effective, with a savings of $128,000 over the projected life of the project equipment.

While currently exempt from regulatory authority, as federal facilities are exempt, the wash rack wash water was identified as a potential significant environmental impact in the RNC draft Environmental Management System (EMS) and as a result was elevated in priority for redesign. The exemption could change at any time so the system was redesigned to meet future compliance.

Although NCA could have saved money by using a standard oil water separator, a water recycling system was more appropriate given the administration's commitment to water conservation, as well as the potential cost savings. The wash station redesign at this cemetery presented an excellent opportunity to try a new type of water recycler and to promote sustainable vehicle washing practices at other cemeteries.

RNC saved money as water usage for vehicle washing decreased markedly. The recycling unit keeps recycling the initial water until it becomes cloudy (turbid). At that point, approximately weekly, the tanks are drained of a small amount of accumulated sediment and additional clear water is added to dilute the water to an acceptable point. In addition, the new system is equipped with a power washer that will remove dirt and debris more effectively while using less water than the original garden hose.

[1] NCA Notice 2004-04, July 13, 2004 Environmental Management at the National Cemetery Administration

The new wash station has been in use for over a year. Water use has decreased by approximately 99%. Based on past and current usage, approximately an $11,400 per year savings has been realized. This results in a payback of about 8.5 years. Every additional year results in substantial savings.

The economic benefit is only a small part of the overall benefits associated with the water recycling unit. RNC's efforts to save water and to correct the wash water drainage will have a direct positive impact on the environment of the adjacent properties.

Life Cycle Cost Analysis

Water Purchase:

20 years X 400,000 gallons per year X $ .03/gallon = $240,000 or $12,000 per year

WaterStax Water Recycler (Expected 20 year life):

Original Cost	$96,000
20 years maintenance@ $200/year	$ 4,000
20 years x 20,000 gallons per year	$12,000
Total	$112,000 or $5,600 per year

Use of the WaterStax will result in savings of $128,000 or an average annual savings over 20 years of $6,400 per year. It is expected that water use and water costs will increase substantially over time as the cemetery expands.

3. Does the project have an internal education or outreach component designed to promote the goals of your project at the facility or within VA or to promote partnerships with the local community, another Government agency, a non-Governmental agency, private industry, or other entity outside your facility?

As a result of the findings and success of the project, a second unit was installed at Los Angeles National Cemetery, and the system is being evaluated for use at the 12 new cemeteries being constructed, and replacement use at existing cemeteries. The project is also being submitted to EPA Region 9 for their Green Government award, and the Department of Energy's Federal Energy and Water Management Awards.

At RNC, wash rack water from the vehicle washing area drained into a swale then into a nearby drainage ditch adjoining the golf course operated by the March Joint Powers Authority. Because the area around RNC contains large amounts of critical habitat for various threatened and endangered species, NCA staff identified a need to implement improved wash rack water management.

Los Angeles National Cemetery (LANC) installed a similar system with even greater water saving results. LANC's wash rack water drained into an adjacent storm drain, which drained into the Pacific Ocean. Now there are no discharges to the storm sewer.

This wash rack wash water technology is now being offered as an alternative in all new or redesigned wash racks throughout NCA. One of the central goals for this project was to identify a water recycling system that meets typical cemetery requirements and preferences for vehicle washing operations.

4. Were performance measures or goals identified to determine the success of the project?

Based on the manufacturer's information, water savings of at least 75% were expected. After a year and a half of use, savings of over 99% have been realized. The 100% elimination of wash rack runoff was expected and achieved.

The 1999 NCA Facilities Design Guide affirms NCA's commitment to install self-contained water recycling systems at vehicle wash facilities to conserve water and to guard against improper discharge of contaminated effluent. Negative experiences in the past have led cemetery staff at other locations to abandon water recycling systems soon after installation. The WaterStax system performed as designed and expected.

RNC Wash Rack

Used water from the original wash pad at RNC flowed into grassed swale to the right of the wash station.

RNC washes 35 pieces of equipment each day. Typical vehicles washed include mowers, dump trucks, and earth-moving equipment. At large, active cemeteries like RNC, wash water management is a critical part of environmental protection

Contractors complete work on RNC's new vehicle wash pad during June 2004. The new vehicle wash area is located behind the maintenance building and **improves the appearance** of the maintenance area

The ramp to the right of the WaterStax unit holds a cart that catches grass clippings and other organic debris from the water recycler. Once debris is removed and the water treated, the **water can be reused for up to a month** before limited disposal is necessary.

The new WaterStax system was installed in late July 2004 and approved for use in late September 2004. Now wash water is treated and disposed of in **compliance with the Clean Water Act**.